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Indian Standard

SPECIFICATION FOR DENTAL CASTING GOLD ALLOYS, NON-PORCELAIN BONDING

(First Revision)

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Indian Standard

SPECIFICATION FOR DENTAL CASTING GOLD ALLOYS, NON-PORCELAIN BONDING

(First Revision)

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Indian Standard

SPECIFICATION FOR DENTAL CASTING GOLD ALLOYS, NON-PORCELAIN BONDING

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 31 January 1985, after the draft finalized by the Precious Metals Sectional Committee had been approved by the Structural and Metals Division Council.

0.2 Casting gold alloys used in dentistry for the fabrication of dental restoration are mainly ternary alloys of gold, silver and copper modified with platinum, palladium and zinc. Three types of gold alloys have been specified and requirements of chemical composition and physical properties have been laid down for each type. Gold and platinum group metals are responsible for good tarnish and corrosion resistance. Silver, copper and zinc are generally added for producing a desired effect in the physical properties of the casting.

0.3 This standard was first published in 1968. In this revision, MKS units have been changed to SI units.

0.4 While preparing this standard, due consideration has been given to the facilities and practices being followed in the country in this field. Assistance has also been derived from the following:

ADA Specification No. 5-1962 Dental casting gold alloys. American Dental Association, New York.

SKINNER (Engene W.) and PHILLIPS (Ralph W.). The science of dental materials. Ed 5. W. B. Saunders Company, London.

Metals Handbook, V 1; Ed 8. Properties and selection of metals. American Society for Metals.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

1.1 This standard covers three types of dental casting gold alloys intended primarily for use in the casting of dental inlays, crowns and bridges.

2. TYPES

2.1 Dental casting gold alloys shall be of the following types:

a) *Type A* (*Soft*) — Those subjected to very slight stress and where burnishing is desired.

b) *Type B* (*Medium*) — Those subjected to moderate stress; three-quarter crowns, abutments, pontics and full crowns.

c) *Type C* (*Hard*) — Those subjected to high stress; thin three-quarter crowns, thin cast backings, abutments, pontics and full crowns.

3. SUPPLY OF MATERIAL

3.1 General requirements relating to the supply of material shall conform to IS : 1387-1967†.

4. CASTING PROPERTIES

4.1 Each ingot shall be of uniform composition and colour throughout.

4.2 The molten gold shall fill the mould completely when cast into dental casting investment (for dental castings) and shall be visually free from porosity and deleterious inclusions.

5. REQUIREMENTS

5.1 Colour — The colour of the alloy shall be that specified by the purchaser.

5.2 Chemical Composition — The chemical composition of dental casting gold alloys shall be as given in Table 1.

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*Rules for rounding off numerical values (*revised*).

†General requirements for the supply of metallurgical materials (*first revision*).

TABLE 1 CHEMICAL COMPOSITION OF DENTAL CASTING GOLD ALLOYS

(*Clause* 5.2)

Type	Percent					
	Gold	Silver	Copper	Palladium	Platinum	Zinc
A	79-92·5	3-12	2-4·5	0-0·5	0-0·5	0-0·5
B	75-78	12-14·5	7-10	1-4	0-1	0-0·5
C	62-78	8-26	8-11	2-4	0-3	0-1·0

5.2.1 The chemical composition shall be determined either by the method specified in IS : 6890 (Part 1)-1973* and IS : 6890 (Part 2)-1975† or any other established instrumental/chemical method. In case of dispute the procedure in the latest edition of IS : 6890 (Part 1) and IS : 6890 (Part 2) for chemical analysis shall be the referee methods.

5.3 Mechanical Properties — The physical properties of the dental casting gold alloys shall be as given in Table 2.

TABLE 2 PHYSICAL PROPERTIES OF DENTAL CASTING GOLD ALLOYS

Alloy Type	*Condition	Brinell Hardness	Tensile Strength	Elongation 50 mm Gauge Length	Liquidus Temperature
		HBS	MPa	Percent	°C
A	Softened	45-70	205-315	20-35	950-1 050
B	Softened	80-90	315-370	20-35	390-970
C	Softened	95-115	335-390	20-25	950-1 000
	Age hardened	115-165	410-560	6-20	

*The heat-treatment should be carried out in accordance with the manufacturer's instructions.

6. PACKING

6.1 The alloy shall be packed in accordance with actual commercial practice. If required, the alloy may be packed in the form of strip (0·25 mm thick and 1 mm wide).

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*Chemical analysis of dental gold alloys: Part 1 Gold, silver, copper, palladium and platinum.

†Chemical analysis of dental gold alloys: Part 2 Determination of nickel and zinc.

6.2 Information to be Supplied by the Manufacturer — Adequate instructions for the melting and casting of the alloy shall accompany each package. This information shall include the recommended temperature range to which the alloy should be heated prior to casting.

6.2.1 The manufacturer shall supply, on request, instructions for the heat-treatment of the alloy.

7. MARKING

7.1 Each container shall be legibly marked with the following:

a) Name or trade-mark of the manufacturer,
b) Type of the alloy,
c) Batch number,
d) Colour of the alloy,
e) Net mass, and
f) Date of manufacture (month and year).

7.1.1 The material may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

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Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002
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Telegrams : Manaksanstha
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